

IN THE CLAIMS:

Claims 1, 3 -10, 12 - 16, 18 - 21, 22 - 26, and 28 - 29 have been amended.

Claims 17 and 27 have been cancelled.

1. (currently amended) A system for host-based QoS provisioning, comprising:
a host system connecting to a network, said host system initiating a data flow[s]
associated with an application running in the host system, said data flow being that are
sent to said network; and

a centralized QoS provisioning mechanism for enforcing flow control ~~applied~~ on
said data flow[[s]] of said application originated from said host system by establishing a
QoS provisioning policy for said application, wherein

said centralized QoS provisioning mechanism ~~connecting~~ is coupled to said host
system, and

said flow control is enforced on said data flow of said application using a filter
and a flow specification constructed for said application based on the QoS provisioning
policy.

2. (original) The system according to claim 1, wherein said host system comprises:
a server; and

at least one client capable of communicating with said server.

3. (currently amended) The system according to claim 2, wherein said
centralized QoS provisioning mechanism ~~comprises~~ includes:

at least one network traffic control agent that ~~that~~ is responsible for enforcing
said flow control, each of said at least one network traffic control agent running on one
of said at least one client, imposing said flow control on said data flow[[s]] initiated by

~~said applications running~~ running on said one of said at least one client;

a network traffic control administrator, capable of running on said server, for conducting centralized QoS provisioning ~~and for performing said centralized QoS provisioning~~ by enforcing said flow control via said at least one network traffic control agent; and

a policy server for storing said QoS provisioning policy.

4. (currently amended) The system according to claim 3, further ~~comprising~~ including:

a console for performing user-level QoS provisioning; and

a network performance statistics collector for collecting network performance related statistics from said host system, said network performance statistics including per flow statistics with respect to said application and local network performance statistics which are ~~being~~ utilized by said network traffic control administrator to ~~perform~~ ~~automatic feedback-driven~~ revise the QoS provisioning policy ~~adaptation~~ for said application.

5. (currently amended) A system for a network traffic control agent, comprising:

a communication unit for interacting with a network traffic control administrator wherein said network traffic control administrator is running on a server in a host system ~~comprising~~ including said server and at least one client;

a filtering unit, residing on one of said at least one client, for filtering an application running on said one client based on a filter, said filtering unit constructed based on a QoS provisioning policy established for said application and received from said network traffic control administrator via said communication unit, ~~said application~~

~~running on one of said at least one client in said host system, said network traffic control agent running on said one of said at least one client; and~~

a flow control enforcement unit for enforcing flow control on a data flow[s] generated by said application according to a flow specification, said flow control enforcement unit constructed based on said QoS provisioning policy and received from said network traffic control administrator via said communication unit, wherein
said application and said network traffic control agent are running on said one client in said host system.

6. (currently amended) The system according to claim 5, further ~~comprising~~ including:

a storage for storing said flow specification received from said network traffic control administrator; and

a flow monitoring unit for collecting per flow information from said data flow[[s]] of said application and sending said per flow information to said network traffic control administrator via said communication unit that is utilized to revise the QoS provisioning policy.

7. (currently amended) A system for a network traffic control administrator, comprising:

a communication unit for communicating with at least one network traffic control agent;

a per-flow usage analysis unit for analyzing per-flow information collected by said at least one network traffic control agent and received via said communication unit[[,]] to generate per-flow usage statistics;

a local network usage information analysis unit for analyzing ~~[[the]]~~ network performance statistics to generate local network usage statistics;

a QoS provisioning unit for conducting centralized QoS provisioning on a data flow associated with an application ~~to through generate a~~ QoS provisioning policy generated for said application ~~and for updating said QoS provisioning policy based on said per flow usage statistics and said local network usage statistics; [[and]]~~

a flow control instruction unit for constructing a filter and a flow specification for said application based on said QoS provisioning policy established for said application, said filter and said flow specification being sent, via said communication unit, to said at least one network traffic control agent to enforce flow control on said data flow generated by said application; and

a QoS provisioning policy updating unit for updating said QoS provisioning ~~policies~~ policy with respect to said application based on application-based feedback-driven adaptation using said per-flow usage statistics and said local network usage statistics.

8. (currently amended) The system according to claim 7, wherein said QoS provisioning policy updating unit ~~comprises~~ includes:

a manual user-driven updating unit for performing manual update of said QoS provisioning policy to generate an updated QoS policy for said application;

an automatic feedback-driven adaptation unit for dynamically adjusting said QoS provisioning policy based on said local network usage statistics and said per-flow usage statistics to generate said updated QoS policy; and

a flow control instruction unit for constructing an updated flow specifications to

be used to enforce flow control on said data flow of said application based on said updated QoS policy for the application.

9. (currently amended) A method for host-based QoS provisioning, comprising:
performing, ~~by a network traffic control administrator,~~ centralized QoS provisioning on a data flow associated with for an application running in a host system ~~by to generate~~ generating a QoS provisioning policy with respect to said application,

~~stored on a policy server, said application running in a host system;~~

constructing, ~~by said network traffic control administrator,~~ a filter and a flow specification according to said QoS provisioning policy, said filter and said flow specification being used to enforce flow control on said data flows initiated from of said application, wherein said filter and said flow specification are constructed adaptively based on the QoS provisioning policy updated through application-based feedback-driven adaptation;

sending said filter and said flow specification to a network traffic control agent;

receiving, by said network traffic control agent, said filter and said flow specification;

filtering, by said network traffic control agent, said application using said filter;

and

enforcing said flow control, based on said flow specification, on said data flow[[s]] of said application.

10. (currently amended) The method according to claim 9, further comprising including:

~~activating, by said network traffic control administrator, a QoS provisioning policy~~

~~updating unit;~~

~~examining generating~~ statistics relevant to the ~~operational status~~ performance of
said data flow and ~~of~~ said host system;

generating an updated QoS provisioning policy with respect to said application
based on said statistics, ~~said updated QoS provisioning policy being stored in said~~
~~policy server;~~

constructing an updated flow specification for said application according to said
updated QoS provisioning policy; and

sending said updated flow specification to said network traffic control agent to
enforce flow control on said data flow of said application.

11. (original) The method according to claim 10, wherein said statistics includes
at least one of:

per-flow usage statistics derived based on per flow information collected by at
least one network traffic control agent; and

local network usage statistics derived based on network performance statistics
collected by a network performance statistics collector.

12. (currently amended) A method for a network traffic control agent, comprising:
receiving a filter and a flow specification from a network traffic control
administrator, said filter and said flow specification being ~~associated with~~ constructed
for an application based on a QoS provisioning policy established for the application;

filtering said application running on a client on which said network traffic control
agent resides, said application initiating a data flow[[s]];

~~retrieving a flow specification associated with said application; and~~

enforcing said flow control on said data flow[[s]] of said application based on said flow specification, wherein

said filter and said flow specification are constructed based on a QoS provisioning policy that is dynamically updated based on per flow usage statistics.

13. (currently amended) The method according to claim 12, further ~~comprising~~ including:

receiving an information collection instruction from said network traffic control administrator;

monitoring said data flows initiated from said application to collect per-flow information specified in said information collection instruction; and

sending said per-flow information to said network traffic control administrator to be utilized for said dynamically updated per flow usage statistics.

14. (currently amended) A method for a network traffic control administrator, comprising:

~~receiving a request for~~ activating centralized QoS provisioning associated with an application, said application being installed on a client where a network traffic control agent resides;

receiving a user-level provisioning specification corresponding to a QoS provisioning policy associated with said application; [[and]]

~~storing said QoS provisioning policy associated with said application in a policy server;~~

constructing a filter ~~associated with~~ for said application based on said QoS provisioning policy associated with said application;

constructing a flow specification for said application based on ~~corresponding to~~
said QoS provisioning policy with respect to ~~associated with~~ said application; and
sending said filter and said flow specification to said network traffic control agent.

15. (currently amended) The method according to claim 14, further ~~comprising~~
including:

receiving per-flow information from at least one network traffic control agent;
generating per-flow usage statistics by analyzing said per-flow information
received from said at least one network traffic control agent;

receiving network performance statistics from a network performance statistics
collector; and

generating local network usage statistics by analyzing said network performance
statistics received from said network performance statistics collector.

16. (currently amended) The method according to claim 15, further ~~comprising~~
including updating said QoS provisioning policy with respect to said application by
utilizing the local network usage statistics and the per flow usage statistics.

Claim 17. (cancelled)

18. (currently amended) The method according to claim ~~[[17]]~~ 16, wherein said
~~performing updating said manual user-driven QoS provisioning policy updating~~
~~comprises~~ includes:

~~examining~~ analyzing said per-flow usage statistics and said local network usage
statistics;

~~determining policy update measures based on said per-flow usage statistics and~~
~~said local network usage statistics; and~~

~~revising entering said updated~~ QoS provisioning policy ~~for said application stored~~
~~in said policy server according to at least one of said per-flow usage statistics and said~~
~~local network usage statistics~~policy update measures.

19. (currently amended) The method according to claim ~~[[17]]~~ 16, wherein ~~said~~
~~performing automatic feedback-driven updating said~~ QoS provisioning policy adaptation
~~comprises includes:~~

~~forking into a plurality of cycles, performing~~ said automatic feedback-driven QoS
provisioning policy adaptation ~~is performed in each of said a plurality of cycles based on~~
~~a different cycle length;~~

~~examining~~ analyzing, in each of said plurality of cycles, said per flow usage
statistics and said local network usage statistics; and

~~computing automatically, in each of said plurality of cycles, adaptation measures~~
~~to be applied to said QoS provisioning policy based on said per flow usage statistics~~
~~and said local network usage statistics;~~

~~revising~~ generating, in each of said plurality of cycles, said updated QoS
provisioning policy for said application ~~stored in said policy server according to~~ based
on results of said analyzing ~~said adaptation measures.~~

20. (currently amended) A computer-readable medium encoded with a program
for host-based QoS provisioning, said program which when executed causes a
computer to comprising:

~~performing, by a network traffic control administrator, perform~~ centralized QoS
provisioning on a data flow associated with ~~for an application~~ running in a host system
by generating a ~~to generate~~ QoS provisioning policy with respect to said application,

~~stored on a policy server, said application running in a host system;~~

~~constructing, by said network traffic control administrator,~~ construct ~~a filter and a~~
flow specification according to said QoS provisioning policy, said filter and said flow
specification being used to enforce flow control on said data flows ~~initiated from~~ of said
application; and

~~send[[ing]]~~ said filter and said flow specification to a network traffic control
agent[[:]]

~~receiving, by said network traffic control agent, said filter and said flow~~
specification;

~~filtering, by said network traffic control agent, said application using said filter;~~
~~and~~

~~enforcing said flow control, based on said flow specification, on said data flows~~
~~of said application.~~

21. (currently amended) The medium according to claim 20, said program,
which when executed causes the computer to further comprising:

~~activating, by said network traffic control administrator, a QoS provisioning policy~~
~~updating unit;~~

~~examining~~ generate ~~statistics relevant to the operational status~~ performance ~~of~~
said host system;

~~generating~~ generate ~~an updated QoS provisioning policy~~ with respect to said
application based on said statistics, ~~said updated QoS provisioning policy being stored~~
~~in said policy server;~~

~~construct[[ing]]~~ an updated flow specification for said application according to

said updated QoS provisioning policy; and

send[[ing]] said updated flow specification to said network traffic control agent to enforce flow control on said data flow of said application.

22. (currently ammended) A computer-readable medium encoded with a program for a network traffic control agent, said program which when executed causes the network traffic control agent to comprising:

~~receiving~~ receive a filter and a flow specification from a network traffic control administrator, said filter and said flow specification being ~~associated with~~ constructed for an application;

filter[[ing]] said application running on a client on which said network traffic control agent resides, said application initiating a data flow[[s]];

~~retrieving a flow specification associated with said application; and~~

enforcing said flow control on said data flow[[s]] of said application based on said flow specification.

23. (currently amended) The medium according to claim 22, said program, which when executed causes the network traffic control agent to further comprising:

~~receiving~~ receive information collection instruction from said network traffic control administrator;

monitor[[ing]] said data flows initiated from said application to collect per-flow information specified in said information collection instruction; and

send[[ing]] said per-flow information to said network traffic control administrator.

24. (currently amended) A computer-readable medium encoded with a program for a network traffic control administrator, said program, which when executed causes

the network traffic control administrator to comprising:

~~receiving a request for~~ activate centralized QoS provisioning associated with an application, said application being installed on a client where a network traffic control agent resides;

~~receiving~~ receive a user-level provisioning specification corresponding to a QoS provisioning policy associated with said application; ~~[[and]]~~

~~storing said QoS provisioning policy associated with said application in a policy server;~~

~~construct[[ing]] a filter and a flow specification associated with~~ for said application based on said QoS provisioning policy associated with said application;

~~constructing a flow specification corresponding to said QoS provisioning policy associated with said application; and~~

~~send[[ing]]~~ said filter and said flow specification to said network traffic control agent.

25. (currently amended) The medium according to claim 24, said program which when executed causes the network traffic control administrator to further comprising:

~~receiving~~ receive per-flow information from at least one network traffic control agent;

~~generating~~ generate per-flow usage statistics by analyzing said per-flow information received from said at least one network traffic control agent;

~~receiving~~ receive network performance statistics from a network performance statistics collector; and

~~generating~~ generate local network usage statistics by analyzing said network performance statistics received from said network performance statistics collector.

26. (currently amended) The medium according to claim 25, said program which when executed causes the network traffic control administrator to further comprising updating update said QoS provisioning policy with respect to said application.

Claim 27 (cancelled).

28. (currently amended) The medium according to claim 2[[7]] 6, wherein ~~said performing user-driven~~ update of said QoS provisioning policy ~~updating comprises~~ includes:

~~examining~~ analyzing said per-flow usage statistics and said local network usage statistics;

~~determining policy update measures based on said per-flow usage statistics and said local network usage statistics; and~~

~~revising~~ adjusting said QoS provisioning policy for said application stored in said policy server according to at least one of said per-flow usage statistics and said local network usage statistics ~~policy update measures~~.

29. (currently amended) The medium according to claim 27, wherein ~~said performing automatic feedback-driven~~ update of said QoS provisioning policy ~~adaptation comprises~~ includes:

~~forking into a plurality of cycles,~~ performing said automatic ~~feedback-driven~~ QoS provisioning policy adaptation ~~is performed in a~~ each of said plurality of cycles based on a different cycle length;

~~examining~~ analyzing, in each of said plurality of cycles, said per flow usage statistics and said local network usage statistics; and

~~computing automatically, in each of said plurality of cycles, adaptation measures to be applied to said QoS provisioning policy based on said per flow usage statistics and said local network usage statistics;~~

~~revising~~ generating, in each of said plurality of cycles, said updated QoS provisioning policy for said application based on results from said analyzing stored in said policy server according to said adaptation measures.